2 PRODUCT DESCRIPTION

OVERVIEW

The LeCroy Model 1872A and 1875A are fast converting, Common Start, sparsifying, 64-channel, time-to-digital converter modules designed for forefront elementary particle or nuclear physics experiments.

Each of the 64 inputs stop the measurement of a time which is started by the com input common to all channels. All inputs are DC-coupled, ECL. The 64 time signals are digitized and the results stored in the module's memory.

The module's physical dimensions, power requirements, control and readout protocol are in compliance with the FASTBUS ECL standard as outlined in the document, IEEE-960-1986. Up to 23 modules may be installed in an appropriately powered crate providing a total of 23x64 = 1472 TDC channels (in a standard 25 slot crate allowing two slots for a master). Larger systems can be built (within the FASTBUS specification) by connecting crate segments via Segment Interconnects (SI) or a LeCroy Model 1821 Segment Manager/Interface (SM/I) module.

FEATURES

The 1872A/75A employs a sparsification scheme to reduce conversion and readout time. Only channels which were hit are digitized and stored. Conversion time varies with the number of hits and is 10 µsec + 2.5 µsec per hit. A typical, 8 hit event will be converted in less than 30 µsec and a full 10 MHz data readout rate is supported in FASTBUS block transfer mode. Thus, a full crate with 184 hit channels (typical case) can be read out in less than 20 µsec (not including FASTBUS Master readout time).

The 1872A/75A digitizes time intervals with three jumper selectable resolutions: 25 psec/count, 50 psec/count, or 100 psec/count. Jumpers marked RESOLUTION, TESTER RESOLUTION AND RESOLUTION P4, P1 and P20 respectively, must be changed as indicated on the module, when changing resolutions. These settings result in full scale ranges of 100 nsec, 200 nsec, or 400 nsec for the 1872A. The 1875A has eight times greater full range as discussed below. See Chapter 5 for calibration details.

The 1872A/75A also contains an internal buffer for multiple events which may be used to eliminate data readout time as a contributor to experimental dead time. Data for the previous event can be read out while the current event is still being converted. Use of this internal buffering is exactly the same as in the LeCroy Model 1882/85F ADC modules and is referred to as F Mode Operation. Operation without internal buffering is referred to as N mode.

OTHER FEATURES

The 1872A digitizes time events into 12 bits. The 1875A provides a 15-bit dynamic range via 12-bit data word and a range bit (X8 or X1). The 1875A may be configured to automatically select the appropriate range for each channel on an event-by-event basis.

The module automatically clears the front end at the end of conversion although digitizing may be interrupted at any time and the modules reset for a new START by applying a CLEAR signal.

An on-board pulser permits time calibration of the TDC channels.

Sixty-four trigger outputs permit easy trigger logic interface.